Space Weather Forecast

Issued on Monday, 26 June 2023 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated R1/R2 Radio Blackouts likely. Slight chance of G1/Minor Geomagnetic Storm conditions on day 2 (27 Jun).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only Common-class flares observed. There are currently twelve sunspot regions on the visible disc, however almost all are small and magnetically simple. The largest and most complex group is in the northwest, and has undergone notable growth and increase in magnetic complexity during the period but is yet to produce a significant flare. A number small sunspots in the northwest have seen minor flaring in recent hours. A number of Coronal Mass Ejections (CMEs) may have occurred late in the UTC day on 25 Jun. One or two may be candidates to have an Earth-directed component, however no imagery is currently available to corroborate this.

Solar Wind / Geomagnetic Activity: The solar wind showed the continued signature of a CME arrival, likely a glance from the CME from the Strong flare on 20 Jun. Speeds were observed at slightly elevated to elevated levels, between 480-550km/s. The total magnetic field strength was largely Moderate but became Weak late in the UTC day on 25 Jun. The north-south component was initially moderately negative (southward). A rotation to largely Moderate northward (positive) values followed around 25/0100 UTC followed by a further period of mainly Moderate negative values between 25/1300-1700 UTC, varying weakly since then. Geomagnetic activity was at G1/Minor Storm levels from 25/0000-0300 UTC, reducing to Quiet to Unsettled (Kp1-3) through the rest of the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has been at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with isolated Moderate-class flares likely and just a very slight chance of activity reaching Strong levels.

Solar Wind / Geomagnetic Activity: There is a CME that may glance Earth very late on day 1 (26 Jun) or more likely on day 2 (27 Jun), from the Moderate flare that occurred on 22 Jun. It is possible that further Earth-directed CMEs may have left the sun late on 25 Jun, however, further solar imagery is required to confirm this. Currently slightly elevated to elevated solar winds are expected to ease to persistently slightly elevated levels. Further coronal hole sourced enhancements are then possible from day 2 (27 Jun) onward however these are low confidence.

Geomagnetic activity is expected to be mainly Quiet to Unsettled before activity potentially increases to Unsettled to Active, with a slight chance of G1 Minor Storms. This is most likely on day 2 (27 Jun) with any slight coronal hole enhancement between days 2 to 4 (27-29 Jun) or potential CME arrivals between days 1 and 4 (26-29 Jun).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring. There is a very slight chance of count rates increasing however, if any notable flares occur.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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